



FREQUENTLY ASKED QUESTIONS ABOUT MTBE

What is MTBE?

Methyl tertiary butyl ether (MTBE) is a volatile, flammable, and colorless liquid that is highly soluble in water. MTBE is used as an oxygenating agent in gasoline and has a detectable odor at low concentrations. Utilization of MTBE is due to its ability to reduce the emissions of gasoline constituents that are either toxic or contribute to the formation of toxic air pollutants and to replace lead as an octane enhancer in unleaded gasoline.

Why is MTBE used in gasoline?

The 1990 Clean Air Act Amendments require areas that exceed the national ambient air quality standard for carbon monoxide to use oxygenated gasoline during the winter when the concentrations of carbon monoxide are highest. Furthermore, since January 1995, the 1990 Clean Air Act Amendments also require nine metropolitan areas that have the most severe ozone pollution to use year-round reformulated gasoline that contains fuel oxygenates.

How might I be exposed to MTBE?

Most people are exposed to MTBE from auto exhaust, or by breathing contaminated air while pumping gasoline. Some people can also be exposed to MTBE from drinking, swimming, or showering in water that has been contaminated with MTBE.

How can MTBE affect my health?

MTBE has a very unpleasant odor that most people can smell before any harmful effects would occur, but others might feel irritation of the nose or throat before noticing the smell. Adverse health effects are not expected to result from the environmental concentrations of MTBE to which most people would be exposed. Studies with rats and mice suggest that drinking high levels of MTBE may cause gastrointestinal irritation, liver and kidney damage, and nervous system effects.

How likely is MTBE to cause cancer?

There is no evidence that MTBE causes cancer in humans. However, MTBE at high concentrations has been reported to cause cancer in laboratory animals. The potential of MTBE to cause cancer has been tested in long-term animal inhalation studies in mice and rats and a long-term oral study in rats. These laboratory animals developed kidney, liver and testicular tumors, leukemia (cancer of blood) and lymphoma (cancer of lymphoid tissues).

What happens to MTBE when it enters the environment?

MTBE quickly evaporates from open containers, surface waters, and from locations that manufacture and store this compound, so it is commonly found as a vapor in the air. MTBE has an estimated half-life of a few days in warm sunny weather, and as many as seven to nine days in colder climates.

What are the ecological effects of MTBE?

MTBE is not expected to bioaccumulate in surface water aquatic organisms or plants found in lakes, ponds, and rivers.

Why is MTBE a drinking water concern?

MTBE is highly soluble in water and moves rapidly into groundwater. It is persistent in groundwater and moves faster than other organic constituents of gasoline. MTBE has been detected in public and private water supplies due to leakage of underground storage tanks and pipelines and in surface water reservoirs (which have recreational boating activities) in a number of states.

Is MTBE in drinking water harmful?

There are no data on the effects on humans of drinking MTBE contaminated water. However, in general, most concentrations at which MTBE has been found in drinking water sources are unlikely to cause adverse health effects.

Is there a medical test to determine whether I have been exposed to MTBE?

There are no specific medical tests to determine whether one has been exposed to MTBE. MTBE and its breakdown product butyl alcohol can be detected in the breath, blood or urine for up to 1 to 2 days after exposure.

Are there any standards or guidelines to protect people from exposure to MTBE?

The Agency for Toxic Substances and Disease Registry's (ATSDR) Minimal Risk Level (MRL) for acute inhalation is 2000 ppb, chronic inhalation is 700 ppb and acute oral consumption is 0.4 mg/kg/day. To protect workers, the American Conference of Governmental Industrial Hygienist (ACGIH) recommends that the amount in workroom air be limited to 40 parts per million (ppm) or 144 milligrams per cubic meter (mg/m^3) on an eight to ten hour work shift. The lifetime health advisory for MTBE in drinking water varies from 10 parts per billion (ppb) to 200 ppb in different states. The Virginia Department of Health, Office of Water Programs has established a trigger level of 15 ppb in public drinking water. The United States Environmental Protection Agency (EPA) has established a drinking water health advisory in the range of 20 to 40 ppb based on taste and odor effects. These levels are lower than the lowest concentrations that caused observable health effects in animals. EPA Reference Concentration (RfC) for MTBE is 900 ppb.

Where can my physician or I get more information?

If you need further information regarding the health effects of MTBE, please contact the Virginia Department of Health, Division of Environmental Epidemiology, 109 Governor Street, 4th Floor, Richmond, VA 23219, or call (804) 864-8182.

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